

Comparisons of Job Characteristics

Focus Occupation: **Materials Engineers (17-2131)**

Associated Occupation: **Mechanical Engineers (17-2141)**

[Compare Knowledge](#)

[Compare Skills](#)

[Compare Abilities](#)

[Compare Detailed Work Activities](#)

[Compare Tools and Technologies](#)

<<	Focus occupation element is much lower
<	Focus occupation element is lower
0	Focus occupation element is at a similar level
>	Focus occupation element is at a higher level
>>	Focus occupation element is at a much higher level

Knowledge

Similarity of Focus Occupation to Associated Occupation: 76

Focus Occupation: Materials Engineers (17-2131)

Associated Occupation: Mechanical Engineers (17-2141)

Associated Occupation's Key Knowledge Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating		Evaluation of Focus Occupation
Engineering and Technology	5.7	21.5	18.9	<	Expanded education and/or training may be required
Design	5.2	21.0	7.9	<<	Extensive education and/or training may be required
Mathematics	9.2	18.1	11.8	<<	Extensive education and/or training may be required
Mechanical	6.8	18.1	8.4	<<	Extensive education and/or training may be required
Physics	4.3	15.3	10.6	<<	Extensive education and/or training may be required
Production and Processing	6.0	14.2	8.1	<<	Extensive education and/or training may be required

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O*NET (Occupation Information Network) data.

Skills

Similarity of Focus Occupation to Associated Occupation: 82

Focus Occupation: Materials Engineers (17-2131)

Associated Occupation: Mechanical Engineers (17-2141)

Associated Occupation's Key Skills Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating		Evaluation of Focus Occupation
Mathematics	6.2	15.3	9.1	<<	Extensive development of skills in this area may be required
Complex Problem Solving	9.1	14.8	12.0	<	A higher skill level may be required
Judgment and Decision Making	9.4	14.1	11.0	<<	Extensive development of skills in this area may be required
Science	4.5	13.6	13.0	0	Current skill level may be sufficient
Operations Analysis	5.0	13.0	11.7	<	A higher skill level may be required

Systems Evaluation	6.4	12.0	8.7	<<	Extensive development of skills in this area may be required
Technology Design	2.6	11.0	4.4	<<	Extensive development of skills in this area may be required
Programming	2.2	7.5	2.4	<<	Extensive development of skills in this area may be required
Installation	1.7	6.3	1.0	<<	Extensive development of skills in this area may be required

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O*NET (Occupation Information Network) data.

Abilities	Similarity of Focus Occupation to Associated Occupation: 94
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Focus Occupation: Materials Engineers (17-2131)
Associated Occupation: Mechanical Engineers (17-2141)

Associated Occupation's Key Abilities Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating		Evaluation of Focus Occupation
Deductive Reasoning	10.6	15.8	14.2	<	Some improvement in abilities may be required
Written Comprehension	11.0	15.8	14.2	<	Some improvement in abilities may be required
Mathematical Reasoning	6.3	15.7	10.2	<<	Extensive improvement in abilities may be required
Information Ordering	9.9	15.4	11.5	<<	Extensive improvement in abilities may be required
Near Vision	11.1	13.3	12.3	0	Current ability level may be sufficient
Number Facility	6.3	13.0	9.2	<<	Extensive improvement in abilities may be required
Category Flexibility	9.0	12.7	11.5	<	Some improvement in abilities may be required
Visualization	7.5	12.7	9.5	<<	Extensive improvement in abilities may be required
Selective Attention	8.7	11.0	8.5	<<	Extensive improvement in abilities may be required
Perceptual Speed	7.4	10.6	8.8	<	Some improvement in abilities may be required

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O*NET (Occupation Information Network) data.

Activities that Both Occupations Have in Common	Similarity of Focus Occupation to Associated Occupation: 95
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Focus Occupation: Materials Engineers (17-2131)
Associated Occupation: Mechanical Engineers (17-2141)

Work Activities	Exclusivity of Activity
Advise clients or customers	19
Advise clients regarding engineering problems	67

Analyze engineering design problems	69
Analyze engineering test data	71
Analyze project proposal to determine feasibility, cost, or time	69
Analyze scientific research data or investigative findings	27
Analyze technical data, designs, or preliminary specifications	47
Analyze test data	64
Calculate engineering specifications	64
Collect scientific or technical data	30
Communicate technical information	4
Compile numerical or statistical data	38
Confer with engineering, technical or manufacturing personnel	25
Coordinate engineering project activities	71
Create mathematical or statistical diagrams or charts	43
Delegate authority for engineering activities	73
Design electronic equipment	74
Design engineered systems	75
Design machines	82
Design manufacturing processes or methods	77
Develop or maintain databases	30
Develop plans for programs or projects	31
Develop policies, procedures, methods, or standards	21
Develop tables depicting data	33
Direct and coordinate activities of workers or staff	3
Draw prototypes, plans, or maps to scale	57
Estimate cost for engineering projects	69
Evaluate costs of engineering projects	70
Evaluate engineering data	60
Evaluate manufacturing or processing systems	68
Examine engineering documents for completeness or accuracy	62
Explain complex mathematical information	30
Follow manufacturing methods or techniques	73
Follow safe waste disposal procedures	50
Follow statistical process control procedures	73
Improve test devices or techniques in manufacturing, industrial or engineering setting	75
Lead teams in engineering projects	73
Plan testing of engineering methods	72
Prepare reports	8
Prepare technical reports or related documentation	22
Provide analytical assessment of engineering data	75
Read blueprints	10
Read technical drawings	7
Recognize characteristics of metals	62
Recommend materials for products	89
Resolve engineering or science problems	46
Test equipment as part of engineering projects or processes	67
Understand engineering data or reports	48
Use computer aided drafting or design software for design, drafting, modeling, or other engineering tasks	58
Use computers to enter, access or retrieve data	3

Use drafting or mechanical drawing techniques	50
Use government regulations	44
Use intuitive judgment for engineering analyses	72
Use knowledge of investigation techniques	16
Use library or online Internet research techniques	21
Use mathematical or statistical methods to identify or analyze problems	30
Use pollution control techniques	62
Use project management techniques	47
Use quality assurance techniques	61
Use quantitative research methods	35
Use relational database software	26
Use research methodology procedures within manufacturing or commerce	75
Use robotics systems technology	78
Use scientific research methodology	21
Use spreadsheet software	18
Use technical information in manufacturing or industrial activities	67
Use technical regulations for engineering problems	61
Use word processing or desktop publishing software	17
Work as a team member	36
Write business project or bid proposals	48
Write product performance requirements	78

Not all positions in these occupations will necessarily perform all of the listed activities. The exclusivity rating is an indication of how unique the activity is amongst all occupations. The maximum rating is 100. High scores indicate that only a small number of occupations engage in that activity.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O*NET (Occupation Information Network) data.

Tools and Technologies that Both Occupations Have in Common

Similarity of Focus
Occupation to Associated
Occupation: 82

Focus Occupation: Materials Engineers (17-2131)
Associated Occupation: Mechanical Engineers (17-2141)

Tools and Technologies	Exclusivity
Business function specific software	1
Cameras	2
Cement and ceramics and glass industry machinery and equipment and supplies	40
Chemical evaluation instruments and supplies	10
Chromatographic measuring instruments and accessories	16
Computer data input devices	2
Computers	1
Content authoring and editing software	1
Data management and query software	1
Development software	4
Electrical measuring and testing equipment	7
Electronic manufacturing and processing machinery	56
Hydraulic presses	25
Indicating and recording instruments	2
Industry specific software	1

Laboratory blending and dispersing and homogenizing equipment and supplies	27
Laboratory boring and grinding and cutting and crushing and pressing equipment	27
Laboratory environmental conditioning equipment	24
Laboratory furnaces and accessories	26
Laboratory ovens and accessories	15
Length and thickness and distance measuring instruments	2
Light and wave generating and measuring equipment	4
Liquid and gas flow measuring and observing instruments	15
Machine tools	7
Mechanical instruments	14
Metals and metallurgy and structural materials testing instruments	15
Non destructive examination equipment	13
Pneumatic tools	8
Power tools	2
Pressure measuring and control instruments	10
Spectroscopic equipment	10
Temperature and heat measuring instruments	6
Viewing and observing instruments and accessories	4
Weight measuring instruments	7

Not all positions in these occupations will necessarily use all of the listed tools and technologies. The exclusivity rating is an indication of how unique the tool or technology is amongst all occupations. The maximum rating is 100. High scores indicate that only a small number of occupations use that tool or technology.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O*NET (Occupation Information Network) data.